PUBLIC HEALTH REPORTS

VOLUME 32 JUNE 1, 1917 No. 22

MAINTENANCE OF HEALTH IN INDUSTRIES.

ITS RELATION TO THE ADEQUATE PRODUCTION OF WAR MATERIALS

By J. W. SCHERESCHEWSKY, Surgeon, United States Public Health Service.

How to safeguard the health of the three and one-half to four million workers in industries producing war materials, such as the metal trades generally and the mining, rubber, shipbuilding, chemical, leather, and motor vehicle industries,[1] is of deep interest at this moment, because in a crisis of this nature the tendency is to speed up industry at the sacrifice of the workers' health. War materials must be produced in unprecedented quantities; continuous maximum production must be maintained. Under such pressing conditions the abiding program of health protection may easily be neglected, and the additional measures necessitated by the influx of a large number of temporary workers may not be taken.

The convincing illustration of this danger is the situation arising in England after the outbreak of the war. The factory laws of England contain many wise provisions for the safeguarding of industries. There is a comprehensive system of workmen's compensation and a sickness insurance law. Women and children are an especially pro-

[1] Industries coming under the English Munitions of War Act are the following:

(*a*) The manufacture or repair of arms, ammunition, ships, vessels, vehicles, and aircraft, and any other articles or parts of articles (whether of a similar nature to the aforesaid or not) intended or adapted for use in war, and of any other ships or vessels, or classes of ships or vessels, or parts of ships or vessels, which may be certified by the Board of Trade to be necessary for the successful prosecution of the war; and of any metals, machines, or tools required for any such manufacture or repair, and of the materials of any class specified in an order for the purpose by the Minister of Munitions, required for or for use in any such manufacture or repair as aforesaid.

(*b*) The construction, alteration, or repair of works of construction and buildings for naval or military purposes, and of buildings in which munitions work is or is intended to be carried on, and the erection of machinery and plant therein, and the erection of houses for the accommodation of persons engaged or about to be engaged on munitions work.

(*c*) The construction, alteration, repair, or maintenance of docks and harbors, and work in estuaries in cases where such construction, alteration, repair, maintenance, or work is certified by the Admiralty to be necessary for the successful prosecution of the war.

(*d*) The supply of light, heat, water, or power, or the supply of tramways facilities in cases where the Minister of Munitions certifies that such supply is of importance for the purpose of carrying on munitions work, and the erection of buildings, machinery, and plant required for such supply.

(*e*) The repair of fire engines and any other fire-brigade appliances in cases where the Minister of Munitions certifies that such repair is necessary in the national interest.

tected class of industrial workers. Nevertheless, when war began, industry in general was speeded up to the breaking point in the desire to produce a maximum output. At many establishments work was continuous seven days in the week. Long periods of overtime were required. Sanitary precautions ordinarily enforced were disregarded. These conditions, aggravated by the enlistment of skilled industrial workers, very quickly resulted in a decline in output, instead of an increase. This led to the general control of the munitions industry by the Munitions of War Act of July, 1915, and the appointment of the Health of Munitions Workers Committee. It became evident in England, as it must be here, that the health of workers should be guarded, not only for the conservation of every resource in this war of resources, but also for the purpose of maintaining in the factories the highest level of production over a protracted period of time.

It is entirely practicable to keep the health of the workers at an efficient point, and thus avoid the difficulty in which England found herself, by steps looking toward (1) the prevention of occupational diseases and poisonings, (2) the sanitation of work places, (3) the prevention of undue fatigue, (4) the medical supervision of workers, and (5) the sanitation of industrial communities. It is the intention to consider in subsequent articles each of these topics in detail. Brief reference, however, will be made to some of their important features.

Sanitation of work places.—Leaving the factor of occupational diseases and poisonings to a later paper, it may be said that for the sanitating of work places definite standards must be established and maintained in regard to hygienic construction, ventilation, illumination, water supply, washing and eating facilities, and disposal of sewage and waste.

The usual standards for factory illumination have in the past been too low, and sufficient attention has not been paid to other factors entering into the promotion of visual ease and comfort, such as avoidance of glare and correct light distribution. Under the present circumstances, however, with the pressing need of raising the output of the individual worker to the maximum, the great frequency of night work, and the probable influx of large numbers of temporary workers, every attention must be paid to provisions for adequate and correct illumination of premises and workrooms. A natural outgrowth of the provisions for proper illumination will be the protection of workers from eye strain by visual examinations of those engaged in fine operations and provision of glasses for workers whose vision needs correcting. The importance of adequate illumination may be seen from the facts that many more industrial accidents

take place during the winter than during the summer and that in a large percentage of accidents defective illumination of the work place is a decided factor in the causation.

That an abundant supply of fresh air is a necessity for workers is of course conceded by all; but in order to prevent listlessness and inability to concentrate the attention, and generally to maintain production at a high level, the physiological stimulus of the air supply must also be considered. This means that not only must the temperature and relative humidity of the air in work places be subject to control and supervision, but the factor of air movement must also be taken into account. Ventilation provisions are particularly important in industries making war materials because the workers are often exposed to highly poisonous dusts and volatile compounds, of which good examples are trinitrotoluol, in the explosives industry, and tetrachlorethane, which has been extensively used as a solvent in aeroplane varnish.

Adequate washing facilities and lunch rooms are highly desirable adjuncts to any industrial establishment and are indispensable whenever the industrial processes concerned involve the handling of poisonous substances. Under war conditions increasing numbers of workers will be exposed to such poisons. Special attention will be required in the case of washing facilities and shower baths, first, as a preventive measure to guard against these poisons, and second, in the case of operations characterized by severe physical labor, exposure to intense heat, or soiling of the body, as a means of promoting personal hygiene and furnishing at the close of the day's work a refreshing physiological stimulus, which promotes the rapid elimination of fatigue products. So far as eating facilities are concerned, the provision for separate lunch rooms will be a necessity in all industries and operations in which the workers come into contact with poisonous materials. This provision is of almost equal importance in other industries where the workers are engaged at high pressure, for the opportunity to obtain good food on the premises, eaten in surroundings other than those of the dust and turmoil of the shop, will enable the meal time to furnish its maximum of comfort and relaxation, thus helping materially in keeping accumulation of fatigue down to a minimum.

Prevention of undue fatigue.—A prerequisite of maximum continuous production is that the worker return to his work completely recuperated from the previous day's fatigue. Probably the most important memorandum contributed by the British committee on the health of munitions workers to the literature of industrial hygiene refers to the relation of hours of labor to bodily fatigue. From these

memoranda and other provisions which have been made, it is evident that we can not make a blanket rule which in emergencies will apply to all industries alike. The health of munitions workers committee is of the opinion that, in the case of men, for heavy labor the maximum weekly hours of labor can not exceed 56 without causing fatigue accumulation; for moderately heavy labor, 60; and for light labor, such as tending semiautomatic machines, probably 64. It is also found that women have not the capacity to stand long hours of work so well as men. The British experience also warns us that at least one day's rest in seven is a necessity.

Medical supervision.—A comprehensive system for the medical supervision of workers is necessary in order to attain the following objects:

(1) Physical examinations as to fitness, so as (*a*) to assign the worker to such work as he is physically fitted to perform to the best advantage, without injury to himself; (*b*) to detect defects and diseases in their incipiency, so that they may be removed by appropriate treatment; (*c*) to guard the personnel from the introduction of communicable diseases.

(2) The provision of adequate medical and surgical relief, so that (*a*) trifling illnesses may be treated in the works' dispensary and serious loss of time avoided; (*b*) an early diagnosis may be made in the event of serious illness; (*c*) arrangements for appropriate treatment may be made.

(3) The detection of the early onset of industrial poisoning and occupational diseases by means of periodical inspections and reexaminations in processes which expose workers to these dangers.

(4) The maintenance of watch and control over the sanitary conditions in industrial plants, so that (*a*) workers are always assured of proper sanitary surroundings, (*b*) protective measures against occupational diseases and industrial poisonings are always maintained.

Sanitation of industrial communities.—Inasmuch as the worker is exposed not only to the environment of the work place, but also to that of the community in which he lives, it is evident that it would be of little use to maintain ideal factory conditions if at the same time the worker were endangered during his leisure hours by defective community sanitation and all the elements for ill health which this implies—such as overcrowding, unsafe water supply, and insanitary surface privies. It is evident, therefore, that if we are to provide for a maximum state of health and efficiency on the part of the workers to meet the present emergency, adequate sanitary conditions in industrial communities must be properly maintained.

Cooperation needed.—To make the above-outlined program efficient in maintaining the health of workers, cooperation is imperative on the part of the public, the owners of factories, the workers, and the various governmental authorities, and all of these have their part to play in thus increasing the output of war materials.

EPIDEMIC CEREBROSPINAL MENINGITIS.

CURRENT PREVALENCE IN CITIES OF THE UNITED STATES.

The table which follows shows the number of cases of epidemic cerebrospinal meningitis notified in cities of the United States having over 10,000 population, as reported to the United States Public Health Service, since April 22, 1917. This table is a continuation of the table which appeared in the PUBLIC HEALTH REPORTS May 4, 1917, page 640.

City.	Cases reported for week ended—				
	Apr. 28.	May 5.	May 12.	May 19.	May 26.
Akron, Ohio [1]					
Albany, N. Y.				1	
Atlantic City, N. J.		2			
Baltimore, Md.	5	9	5	10	8
Binghamton, N. Y.	1				
Birmingham, Ala.				1	1
Boston, Mass.	1	1	2	3	
Bridgeport, Conn.	1	1			
Buffalo, N. Y.	2	3	2		
Canton, Ohio.		1			2
Chicago, Ill.	6	8	12	8	13
Cincinnati, Ohio.		1	1	5	
Cleveland, Ohio.	5	8	7	4	6
Columbus, Ohio.		1		1	
Cumberland, Md.		1			
Dayton, Ohio.	1			1	1
Detroit, Mich.	1	4	5	6	4
Dubuque, Iowa.		1			
Duluth, Minn.	1		2	1	1
Elizabeth, N. J.		1	1		
Erie, Pa.			2		
Galveston, Tex.	1				
Hartford, Conn.	12	7	9	6	4
Indianapolis, Ind.			1		1
Jersey City, N. J.	5				
Kansas City, Kans.	1		1	5	2
Kansas City, Mo.	5		3	4	3
Kenosha, Wis.				1	
Lima, Ohio.				1	
Lancaster, Pa.					1
Los Angeles, Cal.		1		1	
Lowell, Mass.	1	1		1	2
Medford, Mass.	1				
Memphis, Tenn.		1			
Milwaukee, Wis.	1	3	1		2
Minneapolis, Minn.	13	10	8	13	
Nashville, Tenn.					1
Newark, N. J.	2	4		1	
New Britain, Conn.					3
Newburyport, Mass.	1				
New Castle, Pa.			2	1	
New York, N. Y.	16	8	15	23	10
Niagara Falls, N. Y.		1			1
North Adams, Mass.			1		

[1] 55 cases were reported in Akron during the month of April.